

SECTION 2.5

OPERABLE UNIT 10 FORMER SOLVENT STORAGE BUILDING PUMPHOUSE 8210 PUMPHOUSE 8270

2.5.1 SCOPE AND NATURE OF FIVE-YEAR REVIEW

The USAF, in coordination with USEPA, Region I and the MEDEP, conducted this review of the No Further CERCLA Action decisions for the Former Solvent Storage Building (FSSB), Pumphouse (PH) 8210 and PH 8270 sites pursuant to CERCLA section 121(c), NCP section 300.400 (f) (4) (ii), and OSWER Directives 9355.7-02 (May 23, 1991) and 93557-02A (Jun 26, 1994). It is a statutory review. The purpose of the review is to ensure that a remedial action remains protective of public health and the environment. This document has been prepared within the scope of a level I review which is applicable for this site.

2.5.2 SUMMARY OF SITE CONDITIONS

OU-10 is located along the North Flightline and includes the FSSB, PH 8210, and PH 8270 (see Figure 2.5-1). These sites were investigated during an RI (ABB-ES, 1994) and addressed in an Engineering Evaluation/Cost Analysis (EE/CA) (URS, 1995).

FSSB

The FSSB was located near the northeast corner of the Arch Hangar and was used to store paint thinner and solvents for aircraft maintenance. The RI identified solvent- and fuel-related contaminants in soil (ABB-ES, 1994).

PH 8210 and PH 8270.

The PH 8210 and PH 8270 sites, located near the Arch Hangar, were used from the early 1950s through 1963 for fueling and defueling aircraft. In 1992, both pumphouses were demolished and all USTs, valve pits, and piping were removed. The RI identified fuel-related contaminants and localized areas of PCBs in soil (ABB-ES, 1994).

2.5.3 SUMMARY OF RESPONSE ACTION SELECTED

The Air Force evaluated the potential risks to human health and the environment and developed site-specific, risk-based RGs for the removal actions at the FSSB, PH 8210 and PH 8270 sites based on the future land use determinations made in the Disposal ROD. An EE/CA prepared for this site recommended excavation of the contaminated soil and disposal in LF-3 (URS, 1995). In 1992, PCB-contaminated soil was removed from an area north of PH 8210 and an EE/CA was prepared for the PH 8210 and PH 8270 sites recommending excavation and disposal of fuel-contaminated soil in LF-3 (URS, 1995).

Because the removal actions undertaken at the FSSB, PH 8210, and PH 8270 removed contaminated soils that exceeded the RGs, NFA was selected for these sites. This NFA decision was formally documented in the Proposed Plan dated March 1998 (HAZWRAP, 1998a), and the Record of Decision, dated July 1998 (HAZWRAP, 1998b).

Since the land use determinations in the Disposal ROD do not allow for unlimited use and unrestricted exposure, the Air Force conducted this five-year review at the FSSB, PH 8210 and PH 8270 sites in accordance with CERCLA Section 121 and the NCP.

2.5.4 SUMMARY OF RESPONSE ACTION(S) TAKEN

The USAF and USEPA, with concurrence of the MEDEP, have determined that No Further CERCLA Action is necessary for the source areas (i.e., surface and subsurface soils) at the PH 8210 site, the PH 8270 site, and the FSSB site in OU-10 based on the removal actions conducted at these sites between 1995 and 1997.

During removal activities in 1995, approximately 417 cy of contaminated soil were excavated from the FSSB site and disposed of in LF-3 (see Figure 2.5-2). Confirmation samples showed concentrations below the risk-based RGs with the exception of one sample. The area from which this sample was taken was excavated in 1996 (BEI, 1996). Following excavation, confirmation sampling showed concentrations of contaminants below RGs (BEI, 1977). Therefore, NFA was necessary for the FSSB site.

In 1997, approximately 9,775 cy and 2,336 cy of soil contaminated with jet fuel was removed from the areas near PH 8210 and PH 8270, respectively (see Figures 2.5-3 and 2.5-4) (J.T. Langille - Aroostook Engineers, Inc. [JTL], 1998). Additional soil was excavated during pipeline removal activities. The excavated soil was disposed of in LF-3.

Confirmation sampling indicated concentrations of TPH exceeding RGs in one area near PH 8210 and one area near PH 8270; however, the exceedances were located at or below 10 feet bgs, the maximum depth used during risk calculations.

Confirmation sampling also identified concentrations of two SVOCs exceeding RGs near the pumphouses. Remediation goals for these compounds were based on their potential to leach to groundwater rather than human health or ecological risk-based values. The concentrations remaining in the soil at the site do not pose an unacceptable risk to human health or ecological receptors, and although the concentrations exceed the leaching-based RG, the organic leaching model (OLM) tends to be conservative for these compounds and review of available data for groundwater underlying the PH 8210 and PH 8270 sites revealed no detections for these compounds.

Based on the location of TPH exceedances at or below 10 feet bgs and the fact that the concentrations of SVOCs remaining in source area soil do not pose an unacceptable risk to

human or ecological receptors, NFA is necessary for source area soil at the PH 8210 and PH 8270 sites.

Additionally, the Air Force performed unrestricted-land-use evaluations (HAZWRAF, 1999) to determine if the five-year review requirement identified in CERCLA Section 121(c) is necessary. Worst-case RBSCs developed for the unrestricted-land-use evaluations were calculated for four exposure scenarios. The results for each receptor were compared and the lowest value was selected as the worst-case RBSC. For the FSSB, PH 8210, and PH 8270, the results of confirmation samples collected after the removal actions were compared to worst-case RBSCs to determine if any exceedance remains.

For the FSSB site the confirmation sample does not exceed the worst-case RBSCs.

For PH 8210, two SVOCs exceeded their associated worst-case RBSC. These SVOCs are most likely associated with the petroleum products handled through 8210 and therefore are not regulated under CERCLA. Benzo(a)pyrene exceeded its worst-case RBSC, yet the contaminated soil is below 10 feet below ground surface and is therefore no longer a risk to human health. Benzo(a)anthracene exceeded its worst-case RBSC as well as the site cleanup goal, but as agreed to in the Record of Decision for the site, the cleanup goal was established based on a groundwater protective RG and since this contaminate is unlikely to affect groundwater (as witnessed by on-site groundwater results), no further action is necessary.

For PH 8270, there was one SVOC that exceeded its worst-case RBSC. Benzo(a)pyrene was detected above the worst-case RBSC. However, the soils are at depths (below 10 feet) greater than the human health risk based exposure scenarios.

The FSSB, PH 8210, and PH 8270 are considered acceptable for unlimited use and unrestricted exposure, and the five year review is no longer needed.

2.5.5 RESULTS AND RECOMMENDATIONS

2.5.5.1 Results

The No Further CERCLA Action decisions selected for the FSSB, PH 8210, and PH 8270 sites remain protective of human health and the environment.

2.5.5.2 Recommendations

No further five-year reviews are required for these sites outside the scope of OU12, Basewide Groundwater, since the source area cleanups have achieved unlimited use and unrestricted exposure.

2.5.5.3 Statement of Protectiveness

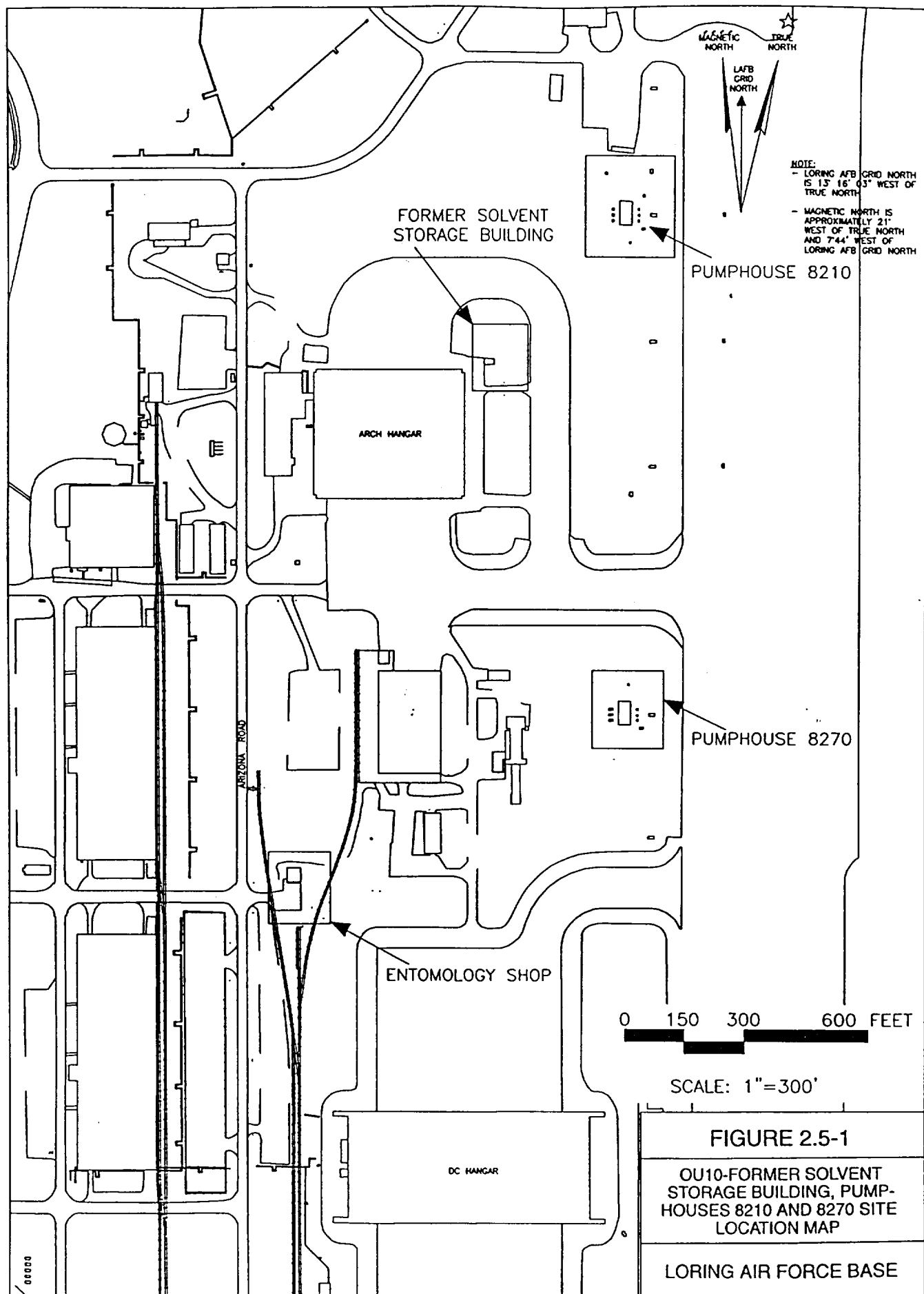
The No Further CERCLA Action decisions selected for the FSSB, PH 8210 and PH 8270 sites remain protective of human health and the environment.

2.5.5.4 Five-Year Reviews

Because of the FBBS, PH 8210 and PH 8270 site source areas are available for unlimited use and unrestricted exposure, no further Five-Year Reviews are necessary. The No Further CERCLA Action decisions selected for the site source areas are protective of human health and the environment and are likely to remain so.

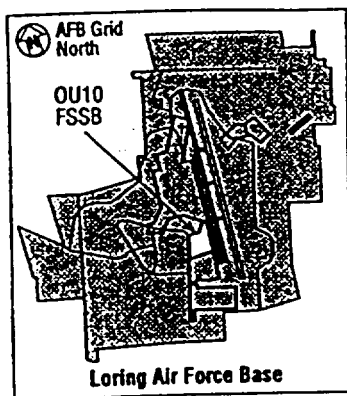
2.5.6 REFERENCES

- ABB-ES, 1994. *North Flightline Operable Unit (OU10) Remedial Investigation Report; Final*, Prepared for HAZWRAP, Portland, Maine, August 1994.
- BEI, 1996. *Removal Actions at Operable Units 5, 8, 9, 10, and 11, Removal Action Report, Final*, Oak Ridge, TN, February 1996.
- BEI, 1997. *Removal Actions at Operable Units 3, 5, 8, 10, 11, and 13, Removal Action Report for 1996 Construction Season, Final*, Oak Ridge, TN, May 1997.
- HAZWRAP, 1998a. *Final Proposed Plan, No Further CERCLA Action for Sites Within Operable Units 3, 5, and 11*. HLA for HAZWRAP, March.
- HAZWRAP, 1998b. *Final No Further CERCLA Action for Sites Within Operable Units 3, 5, 10, and 11, Record of Decision*, HLA for HAZWRAP, March.
- HAZWRAP, 1999. *Technical Memorandum, Unrestricted Land Use Determination for Operable Units 3, 5, 9, 10, and 11, Loring, Maine*, August.
- JTL, 1998. *Removal Action Report for Pumphouse No. 8210 and No. 8270 Remediation Project, Final*, Presque Isle, Maine, December 1997, Revised February 1998.
- URS, 1995. *Engineering Evaluation/Cost Analysis for Operable Units 5, 8, 9, 10, and 11; Final*, Environmental Restoration Program, Denver, Colorado, March 1995.





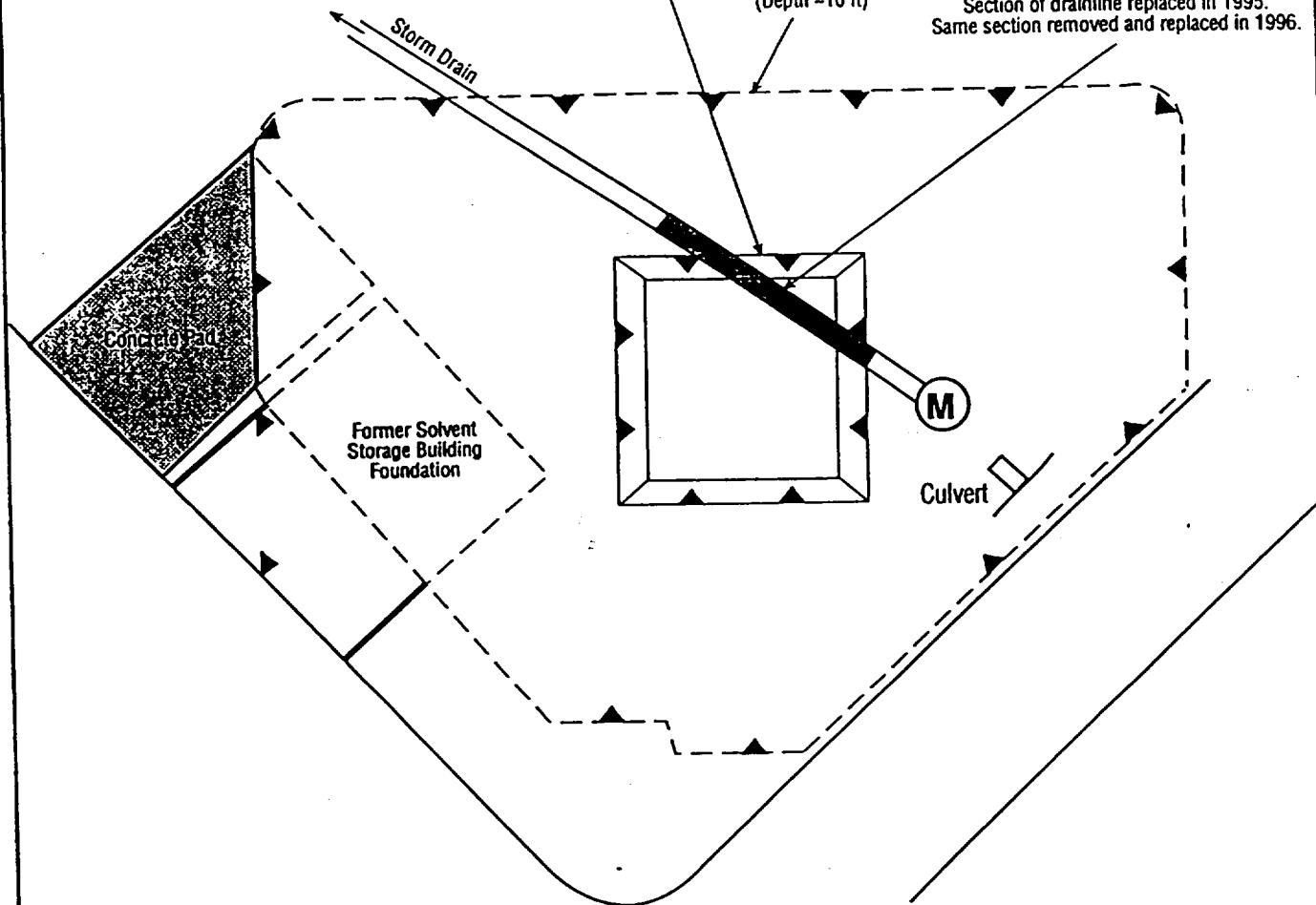
AFB Grid
North



1996 Excavation Limits
~ 45 x 45 ft
(Depth - 12 ft)

1995 Excavation Limits
(Depth - 10 ft)

Section of drainline replaced in 1995.
Same section removed and replaced in 1996.



Legend

(M) Storm drain

15 0 30 feet
Scale

Figure 2.5-2
Former Solvent Storage Building - OU10 Removal Action Summary
Loring Air Force Base
-55-

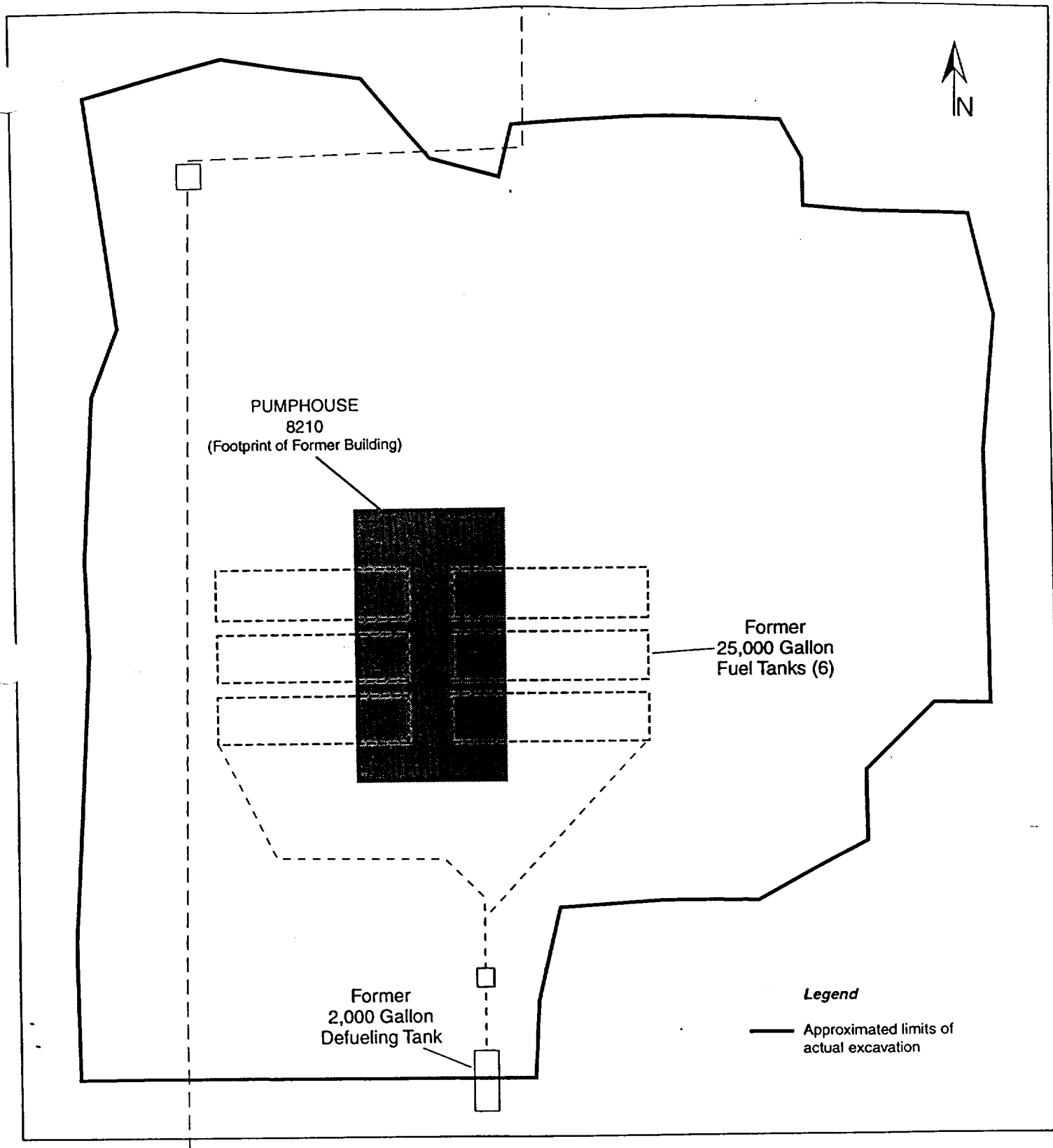


Figure 2.5-3
CERCLA Soils Removal at Pumphouse 8210
Loring Air Force Base

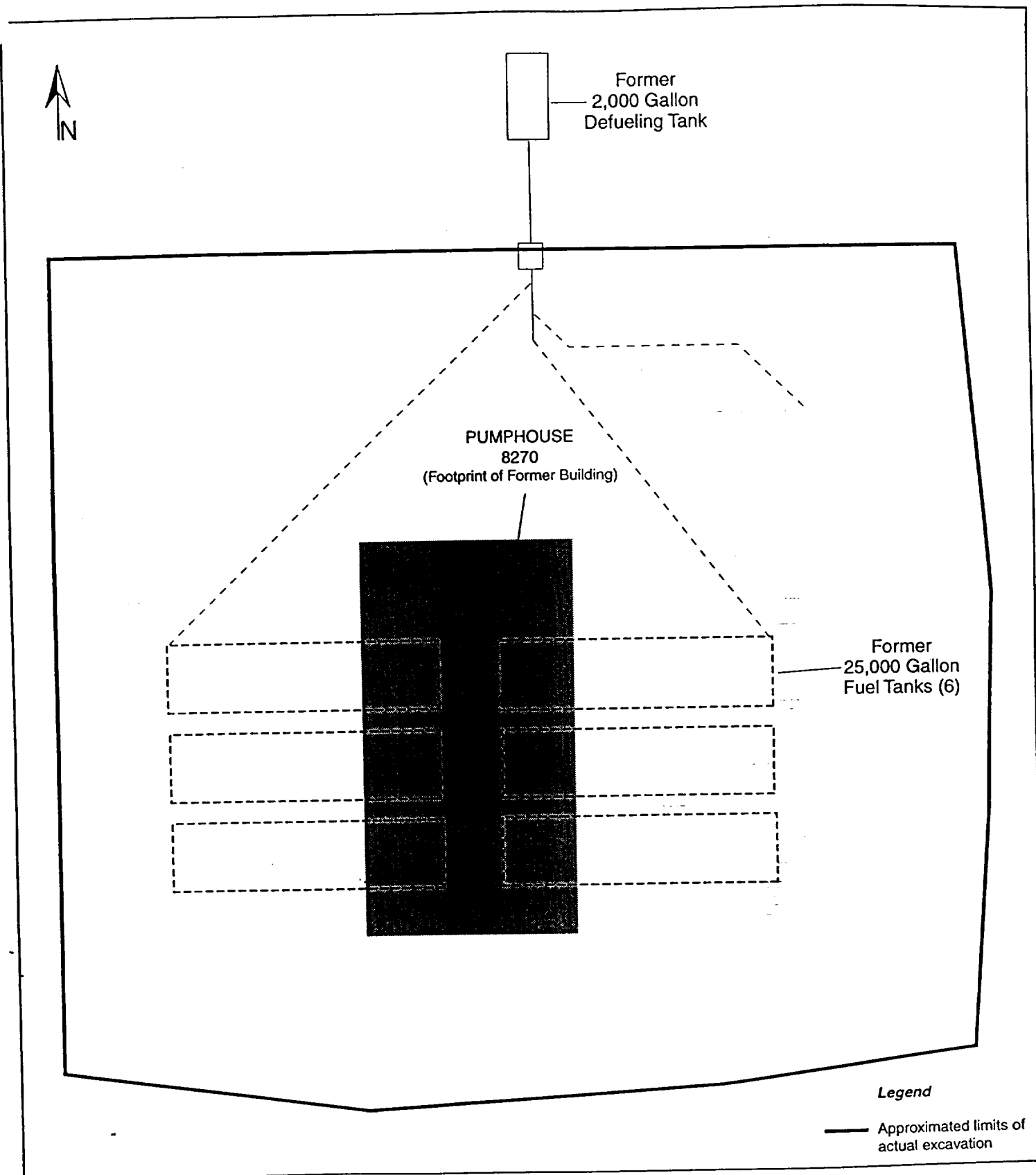


Figure 2.5-4
CERCLA Soils Removal at Pumphouse 8270
Loring Air Force Base
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SECTION 2.6

OPERABLE UNIT 11 REFUELER MAINTENANCE SHOP AREA VEHICLE MAINTENANCE BUILDING

2.6.1 SCOPE AND NATURE OF FIVE-YEAR REVIEW

The USAF, in coordination with USEPA, Region I and the MEDEP, conducted this review of the No Further CERCLA Action decisions for the Refueler Maintenance Shop Area (RMSA), and Vehicle Maintenance Building (VMB) sites pursuant to CERCLA section 121(c), NCP section 300.400 (f) (4) (ii), and OSWER Directives 9355.7-02 (May 23, 1991) and 93557-02A (Jun 26, 1994). It is a statutory review. The purpose of the review is to ensure that a remedial action remains protective of public health and the environment. This document has been prepared within the scope of a level I review which is applicable for this site.

2.6.2 SUMMARY OF SITE CONDITIONS

RMSA

The RMSA site consists of one building and a parking area located on the southwest side of the base, on the eastern side of Pennsylvania Avenue. The RMSA site building was used as a maintenance site for large refueler trucks. Building floor drains were connected to an oil/water separator (OWS) and underground storage tank (UST) located east of the building. A dry well was also located east of the building. The RI identified solvent- and fuel-related contaminants in soil (ABB-ES, 1996). Chlorinated solvents and fuel-related contaminants appear to have been released from a malfunctioning OWS during operations at the RMSA site.

VOCs were detected in two surface soil samples at concentrations of less than 0.1 mg/kg. PCBs (less than 2 mg/kg) and TPH (up to 2,100 mg/kg) were detected in surface soils near the building and concrete pad, adjacent to the building. TPH concentrations beneath paved areas were generally lower. Some inorganics were also detected at concentrations above the established Site background levels. These included barium (38 to 285 mg/kg), cadmium (1 to 7 mg/kg), chromium (26 to 29 mg/kg), lead (13 to 536 mg/kg), mercury (0.4 to 0.5 mg/kg), and zinc (56 to 498 mg/kg).

Subsurface soil contamination was detected near the small concrete pad, at a nearby dry well, and in the drainageway and along the edge of the pavement north of the OWS. Most subsurface soil contamination was identified to be less than 10 feet bgs. Chlorinated and aromatic VOCs were detected in subsurface soils at concentrations up to 9.2 mg/kg. SVOCs, pesticides, and PCBs were detected (less than 5 mg/kg) in subsurface soils. Some inorganics were also detected in subsurface soils above Site background levels. These included barium (28 to 285 mg/kg), cadmium (1 to 7 mg/kg), chromium (26 to 69 mg/kg), cyanide (1 to 202 mg/kg), lead (12 to 536 mg/kg), mercury (0.03 to 0.5 mg/kg), and zinc (52 to 498 mg/kg).

The human health RA conducted as part of the RI concluded that the carcinogenic risk for the commercial/industrial worker, based on the Reasonable Maximum Exposure (RME) and anticipated future commercial/industrial use of the site, was $1\text{E-}05$. The estimated risk is within the USEPA carcinogenic risk range of $1\text{E-}04$ to $1\text{E-}06$ and at the MEDEP cancer risk guidance value of $1\text{E-}05$. The noncarcinogenic risk for the site, based on the RME and anticipated future land use, resulted in an hazard index (HI) of 0.1, which is less than the guidance value of 1. The ecological RA conducted as part of the RI concluded that there were potential risks to ecological receptors. Based on the maximum concentrations detected, HIs for the receptors evaluated ranged from 0.021 to 4.

VMB

The VMB site is on the northwestern corner of OU-11, southeast of the intersection of Pennsylvania and South Carolina Roads. The site occupies approximately 15 acres and includes two buildings. Waste oil, antifreeze, and solvents were generated at the VMB. The OU-11 RI (ABB-ES, 1996) identified fuel contaminants in shallow soil west of the buildings and fuels and PCBs in the drainage ditches east and south of the buildings. Fuels, including TPH, were identified as contaminants at the OWS and the associated grease trap. Additionally, chlorinated solvents were identified as contaminants in a localized "hot spot" area at the southeastern corner of the upper parking lot (ABB-ES, 1996).

VOCs were detected in surface soils at concentrations of less than 0.1 mg/kg. Several SVOCs (less than 2 mg/kg) and PCBs (up to 0.2 mg/kg) were also detected in surface soil. TPH was detected in surface soil at concentrations up to 2,100 mg/kg. A majority of the contamination is present in soils in the area of the former USTs located west of Building 7500 and along the drainage ditch located south of the building. Surface soil and sediment samples collected within the stained drainage ditch south of the building detected aromatic and chlorinated VOCs, SVOCs, pesticides, PCBs and inorganics. TPH was also detected at concentrations up to 45,000 mg/kg.

VOCs were detected in subsurface soil samples at concentrations of less than one (1) mg/kg, but concentrations of VOCs near the former USTs were substantially higher (up to 310 mg/kg of total xylenes). Several SVOCs (up to 25 mg/kg) and PCBs (up to 0.2 mg/kg) were detected in subsurface soils. TPH was also detected in subsurface soils at concentrations up to 1,500 mg/kg. Most of the contamination was detected near the former USTs, and the highest TPH concentrations were located within 15 feet of ground surface.

The human health RA conducted as part of the RI concluded that the carcinogenic risk for the commercial/industrial worker, based on the RME and anticipated future commercial/industrial use of the site, was $2\text{E-}06$. The estimated risk is within the USEPA carcinogenic risk range of $1\text{E-}04$ to $1\text{E-}06$ and below the MEDEP cancer risk guidance value of $1\text{E-}05$. The noncarcinogenic risk for the site, based on the RME and anticipated future land use, resulted in an HI of 0.02, which is less than the guidance value of 1.

The ecological RA conducted as part of the RI concluded that there were minimal potential risks to ecological receptors. Based on the maximum concentrations detected, HIs for the receptors evaluated ranged from 0.0032 to 1.3.

2.6.3 SUMMARY OF RESPONSE ACTION SELECTED

RMSA

An EE/CA for the RMSA site recommended excavation and disposal of contaminated soil. Site-specific, risk-based RGs were developed for PAHs benzo(a)pyrene, PCBs (Aroclors 1254 and 1260), and TPH, based on the future land use determination made in the Disposal ROD, and were included in the EE/CA (URS, 1995).

VMB

An EE/CA completed for the VMB site recommended excavation and disposal of contaminated soil and sediment in the drainage ditch, and bioventing of the soil west of the building in the area of former USTs (URS, 1995). Site-specific, risk-based RGs were developed for VOCs (benzene and xylenes), SVOCs, PCBs (Aroclors 1254 and 1260), and TPH, based on the future land use determination made in the Disposal ROD and were included in the EE/CA (URS, 1996).

Because the land use determinations in the Disposal ROD do not allow for unlimited use and unrestricted exposure, the ROD (HLA, 1998) for the RMSA and VMB sites required the Air Force to conduct this five year review.

2.6.4 SUMMARY OF RESPONSE ACTION(S) TAKEN

RMSA

In 1995, approximately 5,030 cy of contaminated soil were excavated from the RMSA site and disposed of in LF-3. Confirmation soil samples were collected as part of the removal action. Confirmation sampling results indicated contaminant concentrations were below the risk-based RGs with the exception of one localized area east of the building and one location beneath the footing of the building foundation (BEI, 1996). TPH was the only contaminant of concern at both locations that exceeded RGs (see Figure 2.6-2).

Based on the TPH contamination remaining at the RMSA site, a residual risk evaluation was performed (AFBCA, 1998). Results of the evaluation indicated that, given the location of the residual contamination (i.e., underneath the building foundation), human exposure to this contamination is unlikely. Therefore, the detected concentrations of TPH remaining in soil beneath the RMSA building do not pose an unacceptable risk under CERCLA to human health or ecological receptors.

The residual petroleum contamination remaining in the localized area east of the building will be further evaluated in accordance with applicable State requirements (i.e., MEDEP Chapter 691, Rules for Underground Oil Storage Facilities and MEDEP Procedural Guidelines for Establishing Standards for the Remediation of Contaminated Soil and Groundwater).

Because the residual petroleum contamination remaining in soil beneath the building does not pose an unacceptable risk under CERCLA to human health and ecological receptors and the residual petroleum contamination remaining in the localized area east of the building was evaluated in accordance with applicable State requirements, No Further CERCLA Action is necessary for the RMSA site based on the future land use determination made in the Disposal ROD. However, since the land use determinations in the Disposal ROD do not allow for unlimited use and unrestricted exposure, in accordance with the ROD for the RMSA site, the Air Force conducted this five-year review at the site in accordance with CERCLA Section 121 and the NCP.

VMB

In 1995, approximately 4,960 cy of contaminated soil were excavated from the VMB drainage ditches and an area south of the building. The excavated material was disposed of in LF-3. Confirmation soil samples were collected as part of the removal action. Confirmation sampling results indicated contaminant concentrations were below the risk-based RGs with the exception of two locations in the ditch area. The contaminants of concern were benzo(a)pyrene (3.8 mg/kg) at one location and Aroclor-1260 (0.67 mg/kg) at the other location (BEI, 1996).

Based on the contamination remaining at the VMB drainage ditch area, a residual risk evaluation was performed (BEI, 1996). Although the maximum detected concentrations of benzo(a)pyrene and Aroclor-1260 are above the established risk-based RGs, the total cancer risk from benzo(a)pyrene for the most conservative scenario (i.e., commercial worker/industrial worker) is $2.1\text{E-}06$, and the total cancer risk for Aroclor-1260 is $3.5\text{E-}06$; therefore, the summed total cancer risk for these two compounds is $5.6\text{E-}06$. These values are below the MEDEP cancer risk guidance value of $1\text{E-}05$ and within the USEPA carcinogenic target risk range of $1\text{E-}04$ to $1\text{E-}06$. Seven other carcinogenic compounds were detected at the site at concentrations below their respective RGs. Estimation of their contribution to overall risk indicates that they would not result in the total risk exceeding the MEDEP cancer risk guidance value of $1\text{E-}05$ (BEI, 1996).

Based on the assessment of residual risk, the VMB drainage ditch area is within the acceptable USEPA target risk range and below the MEDEP cancer risk guidance value. Therefore, No Further Action is necessary at the VMB drainage ditch area.

Former UST Area. A bioventing system was installed in 1995 to address the fuel-related contamination west of the building in the area of the former USTs. High groundwater levels at the site affected the operation of the system since it was installed. Due to the limited

effectiveness of the bioventing system, a removal action for the soil and subsequent decommissioning of the system occurred in 1998 (see Figure 2.6-3). There are no remaining soils above the site TPH cleanup goal.

Grease Trap. In 1996, the grease trap associated with the OWS at the VMB site, and soil associated with the grease trap, were excavated and disposed of in LF-3. Confirmation soil samples were collected as part of the removal action. Confirmation sampling results indicated exceedances of the risk-based RGs at five locations: one for PCE (3.6 mg/kg), one for Aroclor-1260 (0.43 mg/kg), and three for TPH (2,800; 4,300; and 12,000 mg/kg) (BEI, 1997).

Based on the contamination remaining at the VMB grease trap area, a residual risk evaluation was performed (AFBCA, 1998). The PCE RG of 3 mg/kg was based on potential for groundwater impact above the MCL/MEG. The potential for the residual concentrations of PCE to leach to groundwater was evaluated using site-specific removal information and the OLM. Although the resulting groundwater concentration of 11 µg/L exceeds the MEG of 3 µg/L, because of the conservative nature of the model, small area of residual contamination, and the current contaminated conditions of the aquifer, additional adverse groundwater impacts are not expected. Although the maximum detected concentration of PCE exceeded the RG, the average detected concentration (1.24 mg/kg) did not.

The PCB RG of 0.2 mg/kg was based on a calculation of the concentration of PCBs in soil that would result in a cancer risk of 1E-06 for the most conservative receptor, the commercial/industrial worker, and is based on exposure to contamination from 0 to 2 feet bgs. The detected concentration of residual PCB contamination is at or below 12 feet bgs and does not warrant a commercial/industrial exposure scenario; therefore, the construction worker scenario was calculated to estimate the risk of residual PCB contamination. This results in a risk of 2.7E-07, which is less than the USEPA carcinogenic risk range of 1E-04 to 1E-06 and the MEDEP cancer risk guidance value of 1E-05. Based on the site conditions; the depth (i.e., greater than 10 feet bgs), size, and magnitude of the residual PCE and PCB contamination that exceed the screening criterion; and the unlikelihood of human exposures to this contamination, No Further CERCLA Action is necessary for the grease trap area soils of the VMB site to be protective of human health and ecological receptors (AFBCA, 1998).

The residual petroleum contamination remaining in the grease trap area east of the VMB site will be further evaluated in accordance with applicable State requirements (i.e., MEDEP Chapter 691, Rules for Underground Oil Storage Facilities and MEDEP Procedural Guidelines for Establishing Standards for the Remediation of Contaminated Soil and Groundwater). Therefore, No Further CERCLA Action is necessary for the grease trap area of the VMB site to be protective of human health and ecological receptors.

OWS. The OWS and an estimated 293 cy of associated soil were removed from the VMB site during the 1997 construction season. The excavated soil was disposed of in LF-3 and confirmation samples were collected as part of the removal action. Confirmation sampling results indicated contaminant concentrations were below the site-specific, risk-based RGs

with the exception of two exceedances of TPH; one near the building footing (2,500 mg/kg) and the other near the concrete pad for the OWS (914 mg/kg) (BEI, 1998).

Based on the contamination remaining at the VMB OWS area, a residual risk evaluation was performed (AFBCA, 1998). Given the site conditions and the location of the residual contamination that exceeds the screening criterion (i.e., below the building foundation and at or below 10 feet bgs), human exposures to residual TPH contamination is unlikely. Therefore, No Further Action is necessary at the VMB OWS to be protective of human health and ecological receptors.

“Hot Spot”. Removal actions were conducted at the “Hot spot” area of the VMB site in 1996 and 1997. Approximately 80 cy of soil contaminated with chlorinated solvents was excavated the 1996, transported to the Base Laundry (BL) site, and treated ex-situ with the Soil Vapor Extraction (SVE) system at the site, in accordance with the EE/CA prepared for OU-11 (URS, 1996). Confirmation soil samples collected as part of the removal action indicated exceedances of the site-specific, risk-based RG for the PCE (BEI, 1997a). In 1997, approximately 81 cy of additional soil were excavated from the “hot spot” area and transported to the BL site for treatment with the ex-situ SVE system. Subsequent confirmation soil sampling indicated concentrations of contaminants below the site-specific, risk-based RGs (BEI, 1998).

Because the removal action at the “hot spot” area of the VMB site met the established risk-based RGs, the area does not pose an unacceptable risk under CERCLA to human health or ecological receptors. Therefore, No Further Action is necessary for the “hot spot” area of the VMB site.

VMB Summary. The current VMB site risks are summarized as follows:

- Based on the assessment of residual risk, the VMB drainage ditch area is within the acceptable USEPA target risk range and below the MEDEP cancer risk guidance value.
- The residual petroleum contamination remaining in the grease trap area of the VMB site will be further addressed in accordance with applicable State requirements.
- Because the petroleum contamination remaining at the VMB OWS is below the building foundation and at or below 10 feet bgs, human or ecological exposure to the residual TPH contamination is unlikely. Based on modeling, the potential resulting groundwater contamination does not exceed the risk-based screening value for TPH in groundwater.
- Confirmation soil sampling results from the “hot spot” area indicated that the contaminant is below the site-specific, risk-based RGs.

Because the CERCLA contaminants have been removed or are at concentrations and depths that do not pose an unacceptable risk under CERCLA to human health and ecological

receptors; and petroleum-related contamination remaining, not regulated under CERCLA, will continue to be addressed in accordance with applicable State requirements, No Further CERCLA Action is necessary for the VMB site based on the future land use determination made in the Disposal ROD. However, since the land use determinations in the Disposal ROD do not allow for unlimited use and unrestricted exposure in accordance with the ROD for the VMB site, the Air Force conducted this five-year review at the site in accordance with CERCLA Section 121 and the NCP.

Additionally, the USAF performed unrestricted-land-use evaluations (HAZWRAP, 1999) to determine if the five-year review requirement identified in CERCLA Section 121(c) is necessary. Worst-case RBSCs developed for the unrestricted-land-use evaluations were calculated for four exposure scenarios. The results for each receptor were compared and the lowest value was selected as the worst-case RBSC. For the VMB and RMSA, the results of confirmation samples collected after the removal actions were compared to worst-case RBSCs to determine if any exceedance remains.

For the VMB site the confirmation samples do not exceed the worst-case RBSCs.

At the RMSA, one SVOC, benzo(a)pyrene, exceeded its worst-case RBSC (0.25 mg/kg) in two (0.30 and 0.41 mg/kg) out of 41 samples. All but two of the remaining 39 samples were non-detect. The maximum concentration of 0.41 mg/kg represents a human health risk of 1.64×10^{-6} which is less than the State of Maine policy of 1×10^{-5} and within the EPA acceptable range of 1×10^{-4} and 1×10^{-6} . Further, the benzo(a)pyrene is likely a contaminate related to the petroleum products (i.e. non-CERCLA rated) handled at the RMSA.

Both the VMB and the RMSA are considered acceptable for unlimited use and unrestricted exposure, and the five year review is no longer required.

2.6.5 RESULTS AND RECOMMENDATIONS

2.6.5.1 Results

The No Further CERCLA Action decisions selected for the RMSA and VMB sites remain protective of human health and the environment.

2.6.5.2 Recommendations

No further five-year reviews are required for these sites outside of the scope of OU 12, Basewide Groundwater, since the source area cleanups have achieved unlimited use and unrestricted exposure.

This unrestricted use applies to soils only. Groundwater use restrictions will be addressed under OU-12, "Basewide Groundwater Operable Unit."

2.6.5.3 STATEMENT OF PROTECTIONS

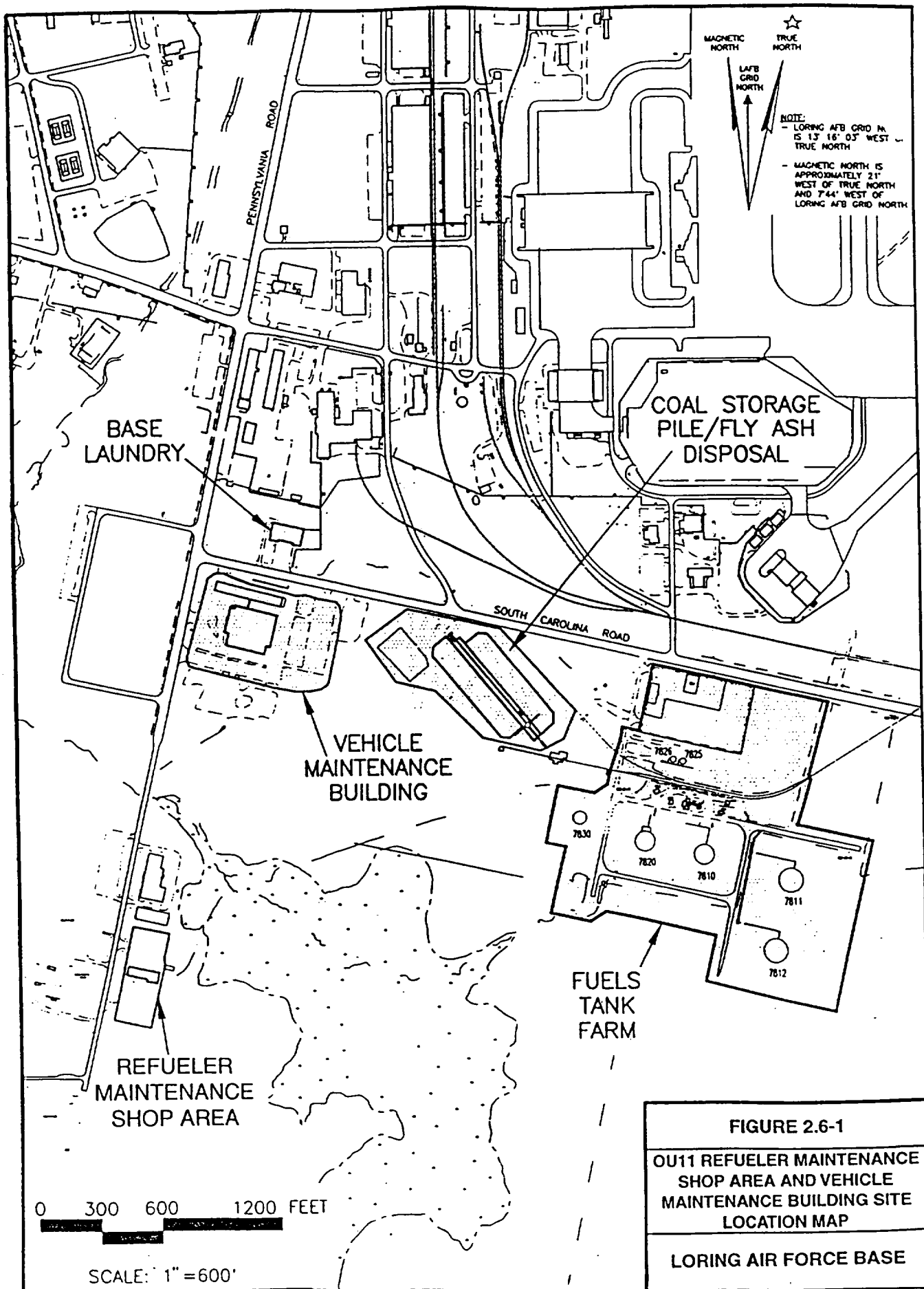
The No Further CERCLA Action decisions selected for the RMSA and VMB sites remain protective of human health and the environment.

2.6.5.4 FIVE-YEAR REVIEWS

Because of the RMSA and VMB site source areas are available for unlimited use and unrestricted exposure, no further Five-Year Reviews are necessary. The No Further CERCLA Action decisions selected for the sites are protective of human health and the environment and are likely to remain so.

2.6.6 REFERENCES

- ABB-ES, 1996. *Operable Unit (OU11) Remedial Investigation Report, Final, Installation Restoration Program, Loring Air Force Base*, January
- AFBCA, 1998. *Letter dated Feb 20, 1998, from AFBCA to USEPA and Maine DEP, Residual Risk Evaluation at the Vehicle Maintenance Building and Refueling Maintenance Shop Area*, Loring Air Force Base, February 29, 1998.
- BEI, 1996. *Removal Actions at Operable Units 5, 8, 9, 10, and 11, Removal Action Report, Final*, Oak Ridge, TN, February 1996.
- BEI, 1997. *Removal Action at Operable Units 3, 5, 8, 10, 11, and 12, Removal Action Report for 1996 Construction Season, Final*, Oak Ridge, TN, May 1997.
- BEI, 1998. *Work Activities at Operable Units 3, 8, and 11 and Madawaska River Site, Removal Action Report for 1998 Construction Season, Final*, Oak Ridge, TN, May 1998.
- HLA, 1998. *Final No Further CERCLA Action for Sites within Operable Units 3, 5, 10, and 11 Record of Decision*, Portland Maine, July 1998.
- HAZWRAF, 1999. *Technical Memorandum, Unrestricted Land Use Determination for Operable Units 3, 5, 9, 10, and 11, Loring, Maine*, August.
- URS, 1995. *Engineering Evaluation/Cost Analysis for Operable Units 5, 8, 9, 10, and 11; Final*, Environmental Restoration Program, Denver, Colorado, March.
- URS, 1996. *Engineering Evaluation/Cost Analysis for Operable Units 5, 8, 9, 10, and 11; Final*, Environmental Restoration Program, Denver, Colorado, March.



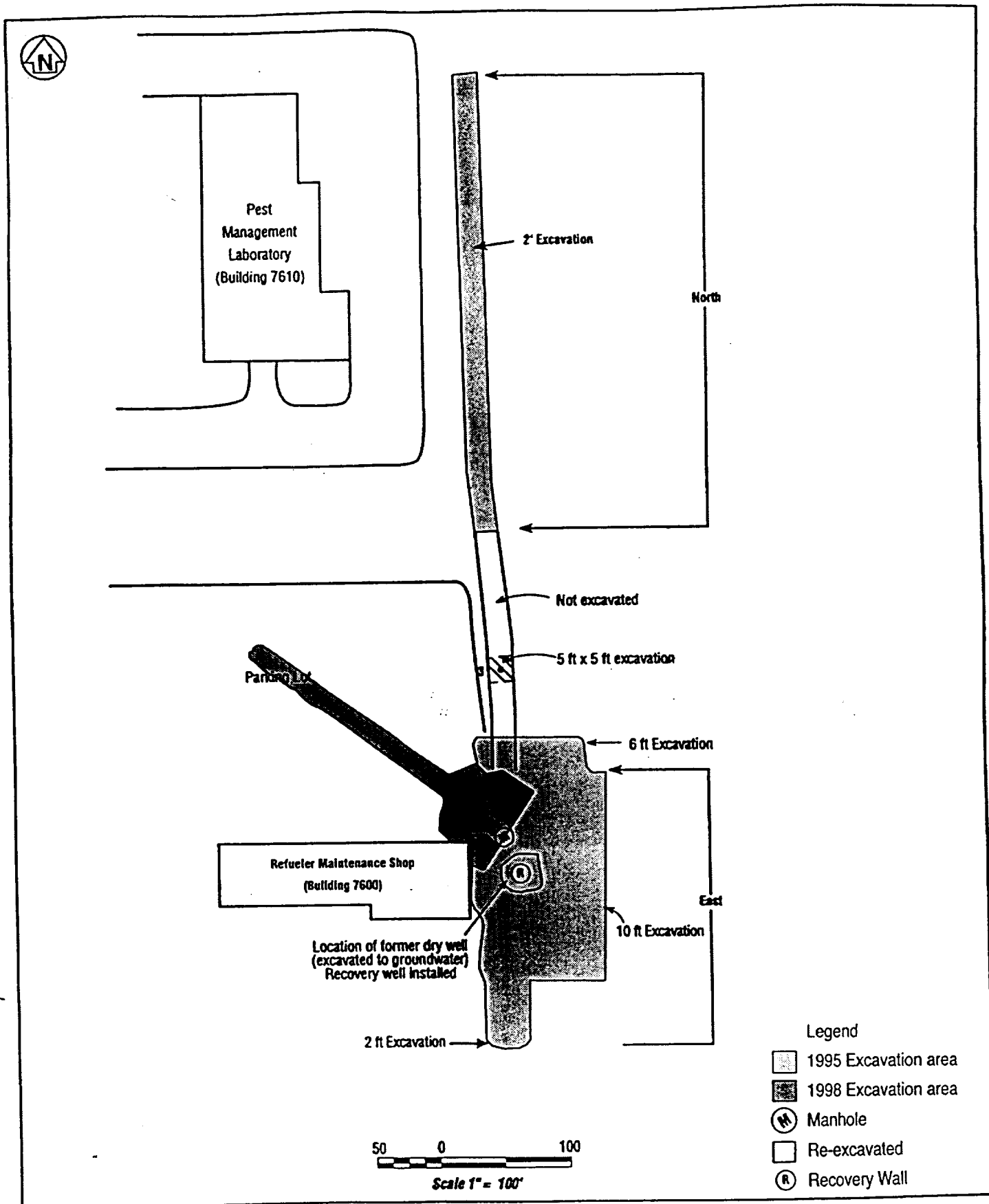


Figure 2.6-2
 OU11, Refueler Maintenance Shop Area Removal Action Summary
 Loring Air Force Base

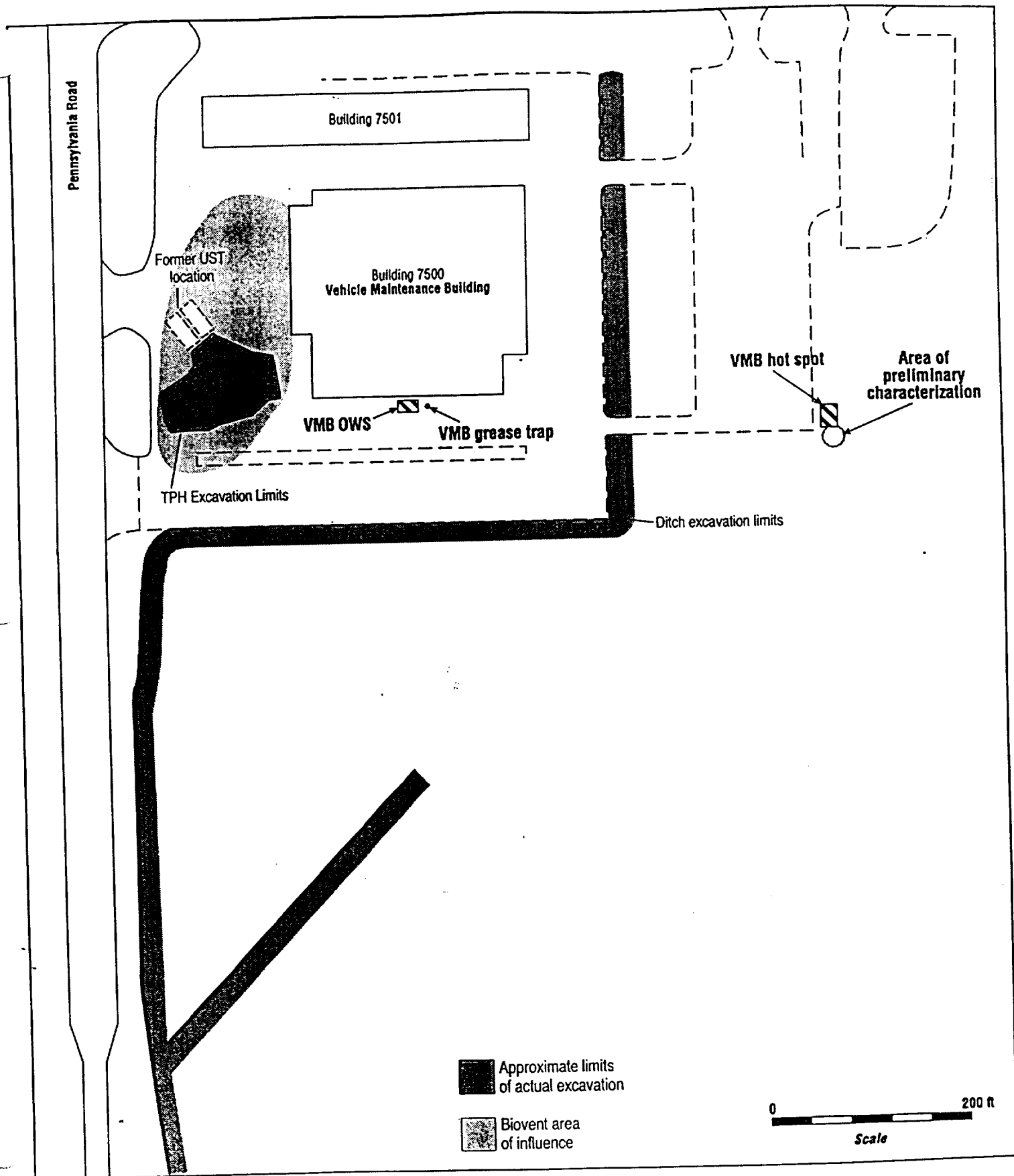


Figure 2.6-3
 Vehicle Maintenance Building Excavations-OU11 Removal Action Summary
 Loring Air Force Base
 -68-

SECTION 3.0

POLICY REVIEW SITES

SECTION 3.1

OPERABLE UNIT 5

FORMER JET ENGINE TEST CELL

3.1.1 SCOPE AND NATURE OF FIVE-YEAR REVIEW

The USAF, in coordination with the USEPA, conducted this review of the Former Jet Engine Test Cell (FJETC) site pursuant to CERCLA § 121(c), NCP § 300.400(f)(4)(ii), and OSWER Directives 9355.7-02 (May 23, 1991) and 9355.7-02A (June 26, 1994). It is a policy review. The remedial action at the FJETC site was installed in 1995, and the bioventing system is currently operating but the remedial objectives have not yet been met. The purpose of the review at the FJETC site is to review the effectiveness of bioventing and assess performance of the system. This document has been prepared within the scope of a level Ia review.

3.1.2 SUMMARY OF SITE CONDITIONS

3.1.2.1 Site Location and Description

The NDA Soils OU-5 is located in the north central portion of the Site and includes the FJETC. The FJETC occupies approximately 1.2 acres of relatively flat open space along the northwestern end of the main runway (Figure 3.1-1). The soils are comprised of approximately 20 feet of glacial till/fill with lenses of higher permeability material containing perched groundwater. Detailed information about the FJETC site is presented in the OU-5 Remedial Investigation Report (Camp Dresser & McKee [CDM], 1996).

3.1.2.2 Site History

The FJETC was used to perform tests on jet engines and once consisted of two buildings, a concrete pad and a cobble lined blast zone. The buildings were decommissioned in 1976 and demolished in 1986. A 2,500-gallon aboveground fuel tank was also present at the site, located on the concrete slab adjacent to the former test cell building. Operations at the FJETC generated JP-4 jet fuel, lubrication oils, hydraulic fluids, wash water, and engine coolants as liquid waste streams. Waste fluids, except for wash water, were drummed and sent to the Defense Reutilization and Marketing Office (DRMO) for disposal.

The likely sources of contamination at the site include the former aboveground storage tank (AST), spills or releases of waste fluids resulting from past site activities, and the potential leaching of contaminants into the subsurface soils in the blast zone by infiltration of precipitation. During SI and RI activities conducted at the FJETC site between 1991 and 1994, 28 TerraProbe explorations and 13 soil borings were completed to characterize the nature and distribution of soil contamination at the site. Several monitoring wells were also installed; however, groundwater associated with the site is being addressed in accordance with OU-12, and is not discussed in this review. The RI identified contaminated soils at the site that contain elevated levels of primarily fuel-related VOCs and SVOCs; however, low

concentrations of chlorinated VOCs were also detected. Subsurface soil in the vicinity of the FJETC is considered a low-level threat waste. There are no principal threat wastes present at the site.

The following is a summary of the COCs in soil (0 to 10 feet bgs) identified during the RI, including the range in concentrations detected and frequency of detection.

Chemical of Concern	Frequency of Detection	Minimum Concentration	Maximum Concentration
Benzene	2/16	0.001	1.2
Methylene chloride	3/16	0.001	36
TCE	2/16	0.001	5.7
Toluene	6/16	0.009	74
Xylene	8/16	0.011	330
1,2-DCA	31/39	0.011	8.7
Naphthalene	6/16	0.98	10
TPH	2/5	1800	4400

Note: All concentrations in mg/kg.

Because of the potential risks to human health, an EE/CA was prepared for the FJETC site recommending a bioventing system to treat an approximately 0.5-acre area of soil contaminated with fuel-related compounds and low concentrations of chlorinated solvents (URS, 1995a). Site-specific, risk-based RGs, which also considered the potential impacts to groundwater due to leaching of contaminants, were developed for the FJETC site and were included in the EE/CA (URS, 1995a).

In 1995, the bioventing system was installed. The final inspection of the bioventing system installation was performed in early spring of 1996, and the system was certified operational and functional (BEI, 1996b). The bioventing system operated until 1998, at which time soil confirmation samples were collected to evaluate the effectiveness of the site remediation. The sampling results indicate fuel-contaminated soils are present throughout the FJETC site at concentrations above the site-specific, risk-based RGs. Based on recommendations from the last semiannual performance report, Air Injection Well (AIW) 101 was installed in January 1999. In July 1999 the cobble-lined blast zone was removed and a dewatering trench was installed to address the perched groundwater.

3.1.3 SUMMARY OF RESPONSE ACTION SELECTED

The USAF and the USEPA, with concurrence of the MEDEP have determined that continued operation of the bioventing system is required at the FJETC site to continue to address the petroleum- and solvent-contaminated subsurface soils. The bioventing system includes AIWs, a blower, an air dryer, a building to house the blower and ancillary equipment, piping, and soil gas monitoring points.

Based on information relating to types of contaminants, environmental media of concern, and potential exposure pathways, remedial objectives were developed. These remedial objectives were developed to mitigate existing and future potential threats to public health and the environment. The remedial action objectives (RAOs) are:

- Prevent human exposure (i.e., ingestion, inhalation, and dermal contact) to contaminated soil with concentrations in excess of remediation goals.
- Prevent ecological exposure (i.e., ingestion, inhalation, and biological uptake) to contaminated soil with concentrations in excess of remediation goals.
- Prevent soil contaminants with concentrations in excess of remediation goals from migrating to groundwater.

Worst-case RBSCs were developed for the *Unrestricted Land Use Determination for OU-9 Snow Barn Site* (HAZWRAP, 2000) that will allow the site to be available for unlimited use and unrestricted exposure. The RGs for the COCs at the FJETC are the lowest of the RBSCs (HAZWRAP, 1999) or the *Action Memorandum for OUs 5, 8, 9, 10, and 11* (URS, 1995b). The RGs are summarized as follows (HLA, 1999).

Chemical of Concern	Remediation Goal
Benzene	1.1
Methylene chloride	1.2
TCE	5.3
Toluene	27
Xylene	21
1,2-DCA	0.13
Naphthalene	0.54
TPH	870

Note: All concentrations in mg/kg.

System operation, performance monitoring, and data reporting will continue to be conducted in accordance with the requirements of the ROD (HLA, 1999) and Operation and Maintenance (O&M) Plan (BEI, 1996a). When soil confirmation sampling results indicate that the site-specific RGs have been achieved and the site is available for unlimited use and unrestricted exposure, treatment by the bioventing system may be terminated.

3.1.4 SUMMARY OF RESPONSE ACTION(S) TAKEN

Based on the *Action Memorandum for OUs 5, 8, 9, 10, and 11* (URS, 1995b), the bioventing system was installed at the FJETC site in 1995. The system included 13 AIWs and seven soil gas monitoring points. Following installation of the bioventing system, a 30-day testing period was initiated during which the system performance was monitored. At the end of this initial performance testing period, the final inspection of the bioventing system was performed and the system was certified operational and functional (BEI, 1996b).

Monitoring point, MP-8, containing an oxygen sensor, was added to the system in 1997. In 1998, soil confirmation samples were collected to evaluate the effectiveness of the site

remediation. The sampling results indicated the extent of contamination extended beyond the treatment zone of the original system. AIW-101 was installed in January 1999 to extend the treatment zone. In July 1999 the cobble-lined blast zone was removed and a dewatering trench was installed to address the perched groundwater. There are currently 14 AIWs and 8 monitoring points at the FJETC site (Figure 3.1-2).

Operation and performance monitoring of the bioventing system at the FJETC site was conducted between 1995 and 1999 and the results are presented in Semiannual Performance Reports. The bioventing system at the FJETC has operated a total of 1,080 days through August 1999.

3.1.4.1 Performance Assessment

The *Semi-Annual Bioventing Performance Report for January-August 1999* (BEI, 1999b) presents the most recent system performance data. Air flow rates are generally highest in the winter and late summer months. The system has been forced to shut down or run at reduced flow rates during the spring and early summer months due to high groundwater. The effectiveness of the FJETC biovent system has been limited by low permeability soils and zones of perched groundwater.

The *Biovent Sites Confirmation Sampling Field/Laboratory Results and Recommendations Report* (BEI, 1999a) recommended that surface water management practices (e.g., trench excavation with sump or site grading and low-permeability cover) be implemented at the FJETC site in an attempt to lower the perched groundwater levels. A dewatering trench was installed in July 1999 at the same time the cobble lined blast zone was removed. The effect of these actions on the system has not been fully evaluated. If the effectiveness of the biovent system can be enhanced the bioventing system will continue to operate until the site-specific risk-based RGs are met.

O&M services are provided to the USAF by an engineering services company under contract to the Air Force Center for Environmental Excellence (AFCEE). BEI held the contract from 1996 until October 1999. Montgomery Watson (MW) currently holds the contract. The O&M services includes all maintenance requirements, monthly system measurements and an annual performance analysis.

3.1.4.2 Standards Assessment

Chemical-specific ARARs

Chemical-specific ARARs (i.e., USEPA Reference Doses [RfDs] and Cancer Slope Factors [CSFs]) were used during the development of the Site-specific, risk-based RGs and have not changed since publication of the RBSCs (HAZWRAP, 1999).

Location-specific ARARs

No location-specific ARARs were identified for the bioventing systems at these sites.

Action-specific ARARs

O&M of the bioventing system at the FJETC site is being conducted in accordance with the action-specific ARARs regarding Federal and State air emissions standards. The bioventing system at the FJETC is an air injection system with no air emissions. Soil sampling was conducted at the FJETC in 1998 in accordance with the action-specific ARARs regarding management of investigation-derived waste (IDW). Future soil confirmation sampling will also be conducted in accordance with these requirements.

Therefore, bioventing at the FJETC site complies with the ARARs presented in the ROD (HLA, 1999).

3.1.5 RESULTS AND RECOMMENDATIONS

3.1.5.1 Results

The remedy selected for the FJETC site under OU-5 (source control) is expected to be protective of human health and the environment upon completion, and immediate threats have been addressed.

The current data do not allow a determination that the bioventing system at the FJETC is functioning as designed. Data that are more complete are required before the determination can be made.

The necessary O&M of the biovent system at the FJETC site is being performed.

3.1.5.2 Recommendations

The impact of the dewatering trench on the effectiveness of the FJETC biovent system should be evaluated in 2000. Annual system performance reviews, including collection and analysis of soil samples to monitor progress toward RGs should be prepared. If little change is noted in treatment effectiveness, alternate remedial alternatives should be considered.

3.1.5.3 Statement on Protectiveness

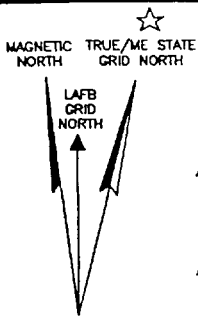
The remedy selected for the FJETC site under OU-5 (source control) remains protective of human health and the environment.

3.1.5.4 Five-Year Reviews

The next five-year review for the FJETC site will be conducted in 2005.

3.1.6 REFERENCES

- BEI, 1996 a. *Bioventing at Operable Units 5, 8, 9, 10, and 11, Operations and Maintenance Plan*; Final; prepared for the Department of the Air Force; Oak Ridge, Tennessee; January 1996.
- BEI, 1996 b. *Bioventing at OUs 5, 8, 9, 10, and 11 Removal Action Report*; Final; prepared for Department of the Air Force; Oak Ridge, Tennessee; April 1996.
- BEI, 1999 a. *Biovent Sites Confirmation Sampling Field/Laboratory Results and Recommendations*; Final; prepared for the Department of the Air Force; Oak Ridge, Tennessee; March 1999.
- BEI, 1999 b. *Bioventing Semiannual Performance Report, January-August 1999*; Final; prepared for the Department of the Air Force; Oak Ridge, Tennessee; December 1999.
- CDM, 1996. *Nose Dock Area Soils Operable Unit (OU-5) Remedial Investigation Report*; Final; Air Force Base Conversion Agency; Loring Air Force Base; prepared for HAZWRAP; Oak Ridge, Tennessee; February 1996.
- HAZWRAP, 2000. *Technical Memorandum, Unrestricted Land Use Determination for Operable Unit 9, Snow Barn Site, Loring, Maine*, January.
- HLA, 1999. *Record of Decision for Sites Within Operable Units 5, 8, 9, 10, and 11*; Final; Installation Restoration Program; Loring Air Force Base; prepared for HAZWRAP; Portland, Maine; September 1999.
- URS, 1995 a. *Engineering Evaluation/Cost Analysis for Operable Units 5, 8, 9, 10, and 11*; Final; Environmental Restoration Program; prepared for Air Force Center for Environmental Excellence; Denver, Colorado; March 1995.
- URS, 1995 b. *Action Memorandum for Operable Units 5, 8, 9, 10, and 11*; Final; Environmental Restoration Program; prepared for Air Force Center for Environmental Excellence; Denver, Colorado; May 1995.



NOTE:
- LORING AFB GRID NORTH
IS 13° 16' 03" WEST OF
TRUE NORTH
- MAGNETIC NORTH IS
APPROXIMATELY 21°
WEST OF TRUE NORTH
AND 7° 44' WEST OF
LORING AFB GRID NORTH

CONCRETE PAD

EXISTING BIOVENTING
SYSTEM BUILDING

FORMER LOCATION OF
COBBLE-LINED
BLAST ZONE

OKLAHOMA ROAD

LEGEND



APPROXIMATE EXTENT OF SOIL CONTAMINATION
AND AREA OF INFLUENCE FOR BIOVENTING SYSTEM

0 50 100 200 FEET



SCALE: 1"=100'

FIGURE 3.1-1

OU5
FORMER JET ENGINE
TEST CELL

LORING AIR FORCE BASE
LIMESTONE, MAINE

